

Claims

1. A fuel injection device (1) that is connected to a high-pressure source (2) and has a multi-part injector body (4; 8, 9, 10) that contains a pressure booster (11) that can be actuated by means of a differential pressure chamber (17) and whose pressure booster piston (14) seals a working chamber (12) off from the differential pressure chamber (17), which fuel injection device (1) can be actuated by means of an on-off valve (5, 70), characterized in that a pressure change in the differential pressure chamber (17) of the pressure booster (11) occurs via a central control line (31) that extends through a pressure booster piston (14).
2. The fuel injection device according to claim 1, characterized in that the central control line (31) extends through the working chamber (12) of the pressure booster (11) and is sealed off from it by means of a high-pressure-tight connection (33, 50, 61).
3. The fuel injection device according to claim 2, characterized in that the central control line (31) extends essentially coaxial to the symmetry axis of the injector body (4; 8, 9, 10).
4. The fuel injection device according to claim 1, characterized in that the central control line (31) extends essentially coaxial to the symmetry axis of the pressure booster piston (14).

5. The fuel injection device according to claim 4, characterized in that the pressure booster piston (14) contains a line section (34, 60, 74) of the central flow line (31) through which the conduit (40) constituting the central control line (31) extends in the working chamber (12) of the pressure booster (11).

6. The fuel injection device according to claim 4, characterized in that the conduit (40) feeds into a recess (35) inside a first housing part (8) of the injector body (4; 8, 9, 10), which recess is connected to the on-off valve (5, 70) via an overflow line (43).

7. The fuel injection device according to claim 5, characterized in that the line section of the central control line (31) is embodied as a tubular piston extension (34).

8. The fuel injection device according to claim 5, characterized in that the line section of the central control line (31) is embodied as a coaxial piston (74) that the pressure booster piston (14) can move in relation to.

9. The fuel injection device according to claims 2 and 5, characterized in that the line section (34) of the central control line (31) supports a spring-loaded sealing sleeve (36) that can move in relation to it and that produces a high-pressure seal (33) of the working chamber (12).

10. The fuel injection device according to claims 2 and 5, characterized in that the line section (34) has a high-pressure-tight guide section (50) that is guided in a first housing part (8) of the injector body (4; 8, 9, 10).

11. The fuel injection device according to claims 2 and 5, characterized in that a piston part (60) that constitutes a line section of the central control line (31) and is encompassed by the pressure booster piston (14) is contained in the pressure booster piston in a sliding fashion and in its head region, is provided with a sealing surface (61) that represents a high-pressure-tight connection.

12. The fuel injection device according to claim 9, characterized in that a spring element (38, 76) that rests against either the line section (74) or against an end (15) of the pressure booster piston (14) presses the sealing sleeve (36) against the injector body (4; 8, 9, 10).

13. The fuel injection device according to claim 5, characterized in that the piston part (60) that constitutes a line section of the central control bore (31) has a hydraulically effective surface and is pressed against a boundary surface of the working chamber (12) of the pressure booster (11) by the fluid contained in the working chamber (12), thus producing a high-pressure-tight connection (61).

14. The fuel injection device according to claim 5, characterized in that the outlet cross sections (77, 78) from the differential pressure chamber (17) to the central control line (31) can be controlled in a stroke-dependent manner.

15. The fuel injection device according to claim 14, characterized in that the pressure change in the differential pressure chamber (17) occurs via a control chamber (20) that is connected to the first outlet cross section (77).

16. The fuel injection device according to claim 14, characterized in that the second outlet cross section (78) is greater than the cross section of the first outlet cross section (77).

17. The fuel injection device according to claim 1, characterized in that the on-off valve (5) is embodied as a 3/2-way valve.

18. The fuel injection device according to claim 1, characterized in that the on-off valve (70) is embodied as a servo-hydraulic 3/2-way valve.